

## Introduction

This special issue is composed of papers presented at the 36th Annual Conference sponsored by Tri-Service Toxicology [Air Force (AFRL/HEST), Navy (NHRC/TD), and Army (USACEHR)]; Army Center for Health Promotion and Prevention Medicine; Air Force Office of Scientific Research; U.S. Environmental Protection Agency, National Center for Environmental Assessment-Cincinnati, OH; Agency for Toxic Substances and Disease Registry; National Institute for Occupational Safety and Health; and the Food and Drug Administration; along with the cooperation of the National Research Council/National Academy of Sciences. The conference titled 'Theories and Practices in Toxicology and Risk Assessment' was held at Cincinnati, Ohio, April 15–18, 2002.

The aim of the conference was to examine the history of the practice of Toxicology and Risk Assessment and its future direction. From its early beginnings as part of the Atomic Energy Program to its use as an integral part of the EPA's risk paradigm, the impact of risk assessment has been substantial and, consequently, it has created considerable interest in the scientific community.

The papers in this issue cover a wide range of topics that were presented during the Conference's 10 scientific sessions. A series of papers examine indirect exposure. In the past, direct pathways of exposure, namely, exposure through the inhalation, oral, and percutaneous pathways were used. However, from the middle 1980s and continuing through the 1990s, it became clear that indirect pathways of exposure to certain toxic contaminants emitted from the air source may lead to higher levels of contamination than direct inhalation exposures. Indirect exposure occurs when these contaminants traverse to other exposure media, such as soil and vegetable crops, but primarily, through terrestrial and aquatic food animals as these contaminants biomagnify through the food chain. Contaminants of concern for indirect exposures are typically characterized as persistent and bioaccumulative toxicants.

A few papers on deployed military personnel who are often exposed to a variety of chemicals have been included to examine the military perspectives and integrated approaches of their risk. Chemical agents that may have been a factor in Gulf War illnesses (e.g., jet fuel and DEET) and chemicals that have been recently identified as environmental contaminants (e.g., perchlorate) were discussed during the Conference. Four papers from the session 'Recent Advances in Ecological Risk Assessment' examine current methods to determine ecological risk. In this session, presentations focused on the integration of

spatial and temporal factors into the risk assessment process.

Two papers from the session on Low-Level Chemical Exposure examine scenarios related to the 9/11 World Trade Center and Pentagon disasters. Clearly, there exists a need to address the potential health implications due to chemical exposure of rescue workers and emergency responders. A paper from the Genomics/Proteomics/Metabolomics session centers on identifying target genes in the brain that are responsive to jet fuel exposure. A few papers discuss current approaches for predictive modeling of inhalation exposure of chemicals to military and civilian populations. Models are presented that evaluate dosimetry and response of inhaled chemicals following long-term low-level or short-term high-level exposure. One paper on risk communication in diverse communities has been included, which illustrates how risk communication principles can be applied effectively. One paper centers on EPA's human exposure modeling and another on the application of pharmacokinetic modeling in risk assessment. The development of computer-based models that translate external measures of exposure to concentrations of toxicants in critical organs and tissues is becoming a widely accepted application in the risk assessment process.

The conference was most informative and productive with approximately 300 attendees, and it created considerable scientific discussion among the participants. The guest editors of this special issue thank all contributors for their papers included in this issue.

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